

- 17 -

CLAIMS

1. Heat exchange unit (1) of the so-called multiservice type comprising a substantially cylindrical shell (2) closed at the opposite ends by respective base plates (3, 4), a plurality of heat exchangers (13) supported inside this shell and in fluid communication with the outside thereof, characterised in that at least part of said exchangers are box-shaped plate exchangers formed from a pair of juxtaposed metallic plates (23, 24) mutually distanced and perimetrically joined, to define an inner chamber (26) intended to be crossed by a heat exchange fluid, a group of a predetermined number of said plate exchangers (13) sharing an inlet (27) and an outlet (28) so that one or more of said plate exchangers contributes to the supply of one of the predetermined services provided by the multiservice heat exchange unit (1) and different heat exchange services are combined inside said shell (2).
2. Heat exchange unit according to claim 1, characterised in that said plate exchangers (13) have a flattened configuration and are grouped in a cylindrical arrangement coaxial to the shell (2), where said plate exchangers (13) are arranged according to a radial configuration.
3. Heat exchange unit according to claim 2, characterised in that said plate heat exchangers (13) are supported in a plurality of coaxial and concentric arrangements and a group of plate exchangers (13) comprises all the exchangers (13) of a same coaxial and concentric arrangement.
4. Heat exchange unit according to any one of the previous claims characterised in that said substantially cylindrical

Best Available Copy

26.08.2004

EP0305840

26. AUG. 2004 12:36

M. ZARDI & CO. +41 091 9105509

NR. 544

P. 9/11

- 18 -

shell (2) is filled with a filler in which said plurality of plate exchangers (13) is immersed.

5. Heat exchange unit according to claim 1, characterised in that said metallic plates (23, 24) of at least one plate exchanger (13) are joined together through a plurality of welding points (34) which give a substantially quilted look.

6. Heat exchange unit according to claim 6, characterised in that said welding points (34) are distributed in 'quinconce' and/or in square pitch.

7. Heat exchange unit according to claim 1, characterised in that said heat exchangers 13 have a substantially rectangular flattened configuration, with opposite long sides (21) parallel to the axis of the shell (2), and opposite short sides (22a, 22b) arranged radially inside said shell (2) and equipped on opposite short sides (22a, 22b) with connectors for the entry (27) and exit (28) of fluid.

8. Heat exchange unit according to claim 8, characterised in that at least one distributor (35) is fixed to a wall of at least one exchanger (13) in a predetermined intermediate position as regards the two opposite short sides (22a, 22b), connected, on one side, with said chamber (26) of said exchanger (13) and, on the other side, with a duct (39) for feeding fluid.

9. Heat exchange unit according to claim 9, characterised in that said distributor (35) comprises a carter (41) essentially forming a channelling which, when fixed to said metallic plate (23) of said at least one exchanger (13), forms with it a chamber (42) in communication with the

Best Available Copy

- 19 -

inside of the exchanger (13) through a plurality of through-holes (40).

10. Heat exchange unit according to claim 1, characterised in that at least one of said exchangers (13) is internally
5 equipped with a separator plate (46), extending from one side (22a) of said exchanger (13), towards a side (22b) opposite it and from which said plate (46) is in a predetermined spaced relationship, said separator plate (46) having a predetermined length less than that of said
10 long sides (21), as to which it has a predetermined inclination.

11. Heat exchange unit according to claim 1, characterised in that at least one of said exchangers (13) is internally
15 equipped in correspondence with the opposite long sides (21) of at least one distributor/collector duct (48), said duct (48) being connected, on one side, to said chamber (26) through at least one opening (50) and, on the other side, to the outside of the exchanger (13), through a connector (27).

20 12. Heat exchange unit according to claim 12, characterised in that said duct (48) is formed directly in a long side (21) of the exchanger (13).

13. Heat exchange unit according to claim 12, characterised in that said at least one exchanger (13) is subdivided into
25 a plurality of chambers (55).

14. Heat exchange unit according to claim 8, characterised in that said plate exchangers (13) define an inner chamber (26) of variable size growing in the direction of the imaginary line joining the connectors (27, 28).

Best Available Copy

28. SEP. 2004 9:19
26-08-2004

9:19

EPO MUNICH

▲ 26-08-2004

NR.739

S.9

26-08-2004

26. AUG. 2004 12:36

EPO MUNICH

M. ZHUKI & CO. +41 091 9106509

NR.544

P.11/11

- 20 -

15. Heat exchange unit according to claim 8, characterised in that said plate exchangers (13) define an inner chamber (26) of variable size decreasing in the direction of the imaginary line joining the connectors (27, 28).

Best Available Copy

Empf.zeit:26/08/2004 12:41

AMENDED SHEET 540 P.011